General

Guideline Title

Management of stable angina.

Bibliographic Source(s)

National Clinical Guideline Centre. Management of stable angina. London (UK): National Institute for Health and Clinical Excellence (NICE); 2011 Jul. 34 p. (Clinical guideline; no. 126).

Guideline Status

This is the current release of the guideline.

Recommendations

Major Recommendations

Note from the National Guideline Clearinghouse (NGC): This guideline was developed by the National Clinical Guideline Centre on behalf of the National Institute for Health and Clinical Excellence (NICE). See the "Availability of Companion Documents" field for the full version of this guidance.

Diagnosis

Diagnose stable angina according to 'Chest pain of recent onset' (see the NICE guideline Chest pain of recent onset). Diagnose and manage unstable angina and non-ST-segment-elevation myocardial infarction (NSTEMI) according to 'Chest pain of recent onset' (see the NICE guideline Chest pain of recent onset), 'Unstable angina and NSTEMI' (see the NICE guideline Unstable angina and NSTEMI) and 'MI: secondary prevention' (see the NICE guideline Post myocardial infarction).

Information and Support for People with Stable Angina

Clearly explain stable angina to the person, including factors that can provoke angina (for example, exertion, emotional stress, exposure to cold, eating a heavy meal) and its long-term course and management. When relevant, involve the person's family or carers in the discussion.

Encourage the person with stable angina to ask questions about their angina and its treatment. Provide opportunities for them to voice their concerns and fears.

Discuss the person's, and if appropriate, their family or carer's ideas, concerns and expectations about their condition, prognosis and treatment. Explore and address any misconceptions about stable angina and its implications for daily activities, heart attack risk and life expectancy.

Advise the person with stable angina to seek professional help if there is a sudden worsening in the frequency or severity of their angina.

Discuss with the person the purpose and any risks and benefits of their treatment.

Assess the person's need for lifestyle advice (for example about exercise, stopping smoking, diet and weight control) and psychological support, and offer interventions as necessary.

Explore and address issues according to the person's needs, which may include:

- Self-management skills such as pacing their activities and goal setting
- Concerns about the impact of stress, anxiety or depression on angina
- Advice about physical exertion including sexual activity

General Principles for Treating People with Stable Angina

Do not exclude people with stable angina from treatment based on their age alone.

Do not investigate or treat symptoms of stable angina differently in men and women or in different ethnic groups.

Preventing and Treating Episodes of Angina

Offer a short-acting nitrate for preventing and treating episodes of angina. Advise people with stable angina:

- How to administer the short-acting nitrate
- To use it immediately before any planned exercise or exertion
- That side effects such as flushing, headache and lightheadedness may occur
- To sit down or find something to hold on to if feeling light-headed

When a short-acting nitrate is being used to treat episodes of angina, advise people:

- To repeat the dose after 5 minutes if the pain has not gone
- To call an emergency ambulance if the pain has not gone 5 minutes after taking a second dose

Drugs for Secondary Prevention of Cardiovascular Disease

Consider aspirin 75 mg daily for people with stable angina, taking into account the risk of bleeding and comorbidities.

Consider angiotensin-converting enzyme (ACE) inhibitors for people with stable angina and diabetes. Offer or continue ACE inhibitors for other conditions, in line with relevant NICE guidance.

Offer statin treatment in line with Lipid modification (NICE clinical guideline 67).

Offer treatment for high blood pressure in line with 'Hypertension' (see the NGC summary of the NICE guideline Hypertension. Clinical management of primary hypertension in adults).

Dietary Supplements

Do not offer vitamin or fish oil supplements to treat stable angina. Inform people that there is no evidence that they help stable angina.

Anti-anginal Drug Treatment

General Recommendations

Offer people optimal drug treatment for the initial management of stable angina. Optimal drug treatment consists of one or two anti-anginal drugs as necessary plus drugs for secondary prevention of cardiovascular disease.

Advise people that the aim of anti-anginal drug treatment is to prevent episodes of angina and the aim of secondary prevention treatment is to prevent cardiovascular events such as heart attack and stroke.

Discuss how side effects of drug treatment might affect the person's daily activities and explain why it is important to take drug treatment regularly.

Patients differ in the type and amount of information they need and want. Therefore the provision of information should be individualised and is likely to include, but not be limited to:

- What the medicine is
- How the medicine is likely to affect their condition (that is, its benefits)
- Likely or significant adverse effects and what to do if they think they are experiencing them
- How to use the medicine
- What to do if they miss a dose
- Whether further courses of the medicine will be needed after the first prescription
- How to get further supplies of medicines. (This recommendation is from 'Medicines adherence' [see the NICE guideline Medicines adherence. Involving patients in decisions about prescribed medicines and supporting adherence].)

Review the person's response to treatment, including any side effects, 2–4 weeks after starting or changing drug treatment.

Titrate the drug dosage against the person's symptoms up to the maximum tolerable dosage.

Drugs for Treating Stable Angina

Offer either a beta blocker or a calcium channel blocker as first-line treatment for stable angina. Decide which drug to use based on comorbidities, contraindications and the person's preference.

If the person cannot tolerate the beta blocker or a calcium channel blocker, consider switching to the other option (calcium channel blocker or beta blocker).

If the person's symptoms are not satisfactorily controlled on a beta blocker or a calcium channel blocker, consider either switching to the other option or using a combination of the two.*

*When combining a calcium channel blocker with a beta blocker, use a dihydropyridine calcium channel blocker, for example, slow release nifedipine, amlodipine or felodipine.

Do not routinely offer anti-anginal drugs other than beta blockers or calcium channel blockers as first-line treatment for stable angina.

If the person cannot tolerate beta blockers and calcium channel blockers or both are contraindicated, consider monotherapy with one of the following drugs:

- A long-acting nitrate or
- Ivabradine or
- Nicorandil or
- Ranolazine

Decide which drug to use based on comorbidities, contraindications, the person's preference and drug costs.

For people on beta blocker or calcium channel blocker monotherapy whose symptoms are not controlled and the other option (calcium channel blocker or beta blocker) is contraindicated or not tolerated, consider one of the following as an additional drug:

- A long-acting nitrate or
- Ivabradine* or
- Nicorandil** or
- Ranolazine

*When combining ivabradine with a calcium channel blocker, use a dihydropyridine calcium channel blocker, for example, slow release nifedipine, amlodipine, or felodipine.

**At the time of publication (July 2011), nicorandil did not have UK marketing authorisation for this indication. Informed consent should be obtained and documented.

Decide which drug to use based on comorbidities, contraindications, the person's preference and drug costs.

Do not offer a third anti-anginal drug to people whose stable angina is controlled with two anti-anginal drugs.

Consider adding a third anti-anginal drug only when:

- The person's symptoms are not satisfactorily controlled with two anti-anginal drugs and
- The person is waiting for revascularisation or revascularisation is not considered appropriate or acceptable

Decide which drug to use based on comorbidities, contraindications, the person's preference and drug costs.

Investigation and Revascularisation

People with Stable Angina Whose Symptoms Are Not Satisfactorily Controlled with Optimal Medical Treatment

Consider revascularisation (coronary artery bypass graft [CABG] or percutaneous coronary intervention [PCI]) for people with stable angina whose symptoms are not satisfactorily controlled with optimal medical treatment.

Offer coronary angiography to guide treatment strategy for people with stable angina whose symptoms are not satisfactorily controlled with optimal medical treatment. Additional non-invasive or invasive functional testing may be required to evaluate angiographic findings and guide treatment decisions. (This recommendation partially updates recommendation 1.2 of 'Myocardial perfusion scintigraphy for the diagnosis and management of angina and myocardial infarction' [see the NICE Web site for Myocardial perfusion scintigraphy for the diagnosis and management of angina and myocardial infarction].)

Offer CABG to people with stable angina and suitable coronary anatomy when:

- Their symptoms are not satisfactorily controlled with optimal medical treatment and
- Revascularisation is considered appropriate and
- PCI is not appropriate

Offer PCI to people with stable angina and suitable coronary anatomy when:

- Their symptoms are not satisfactorily controlled with optimal medical treatment and
- Revascularisation is considered appropriate and
- CABG is not appropriate

When either procedure would be appropriate, explain to the person the risks and benefits of PCI and CABG for people with anatomically less complex disease whose symptoms are not satisfactorily controlled with optimal medical treatment. If the person does not express a preference, take account of the evidence that suggests that PCI may be the more cost-effective procedure in selecting the course of treatment.

When either procedure would be appropriate, take into account the potential survival advantage of CABG over PCI for people with multivessel disease whose symptoms are not satisfactorily controlled with optimal medical treatment and who:

- Have diabetes or
- Are over 65 years or
- Have anatomically complex three-vessel disease, with or without involvement of the left main stem

Consider the relative risks and benefits of CABG and PCI for people with stable angina using a systematic approach to assess the severity and complexity of the person's coronary disease, in addition to other relevant clinical factors and comorbidities.

Ensure that there is a regular multidisciplinary team meeting to discuss the risks and benefits of continuing drug treatment or revascularisation strategy (CABG or PCI) for people with stable angina. The team should include cardiac surgeons and interventional cardiologists. Treatment strategy should be discussed for the following people, including but not limited to:

- People with left main stem or anatomically complex three-vessel disease
- People in whom there is doubt about the best method of revascularisation because of the complexity of the coronary anatomy, the extent of stenting required or other relevant clinical factors and comorbidities.

Ensure people with stable angina receive balanced information and have the opportunity to discuss the benefits, limitations and risks of continuing drug treatment, CABG and PCI to help them make an informed decision about their treatment. When either revascularisation procedure is appropriate, explain to the person:

- The main purpose of revascularisation is to improve the symptoms of stable angina.
- CABG and PCI are effective in relieving symptoms.
- Repeat revascularisation may be necessary after either CABG or PCI and the rate is lower after CABG.
- Stroke is uncommon after either CABG or PCI, and the incidence is similar between the two procedures.
- There is a potential survival advantage with CABG for some people with multivessel disease.

Inform the person about the practical aspects of CABG and PCI. Include information about:

- Vein and/or artery harvesting
- Likely length of hospital stay
- Recovery time
- Drug treatment after the procedure

People with Stable Angina Whose Symptoms Are Satisfactorily Controlled with Optimal Medical Treatment

Discuss the following with people whose symptoms are satisfactorily controlled with optimal medical treatment:

- Their prognosis without further investigation
- The likelihood of having left main stem disease or proximal three-vessel disease
- The availability of CABG to improve the prognosis in a subgroup of people with left main stem or proximal three-vessel disease
- The process and risks of investigation
- The benefits and risks of CABG, including the potential survival gain

After discussion (see above) with people whose symptoms are satisfactorily controlled with optimal medical treatment, consider a functional or non-invasive anatomical test to identify people who might gain a survival benefit from surgery. Functional or anatomical test results may already be available from diagnostic assessment. (This recommendation partially updates recommendation 1.2 of 'Myocardial perfusion scintigraphy for the diagnosis and management of angina and myocardial infarction' [see the NICE Web site for Myocardial perfusion scintigraphy for the diagnosis and management of angina and myocardial infarction].)

After discussion (see above) with people whose symptoms are satisfactorily controlled with optimal medical treatment, consider coronary angiography when:

- Functional testing indicates extensive ischaemia or non-invasive anatomical testing indicates the likelihood of left main stem or proximal three-vessel disease and
- Revascularisation is acceptable and appropriate

Consider CABG for people with stable angina and suitable coronary anatomy whose symptoms are satisfactorily controlled with optimal medical treatment, but coronary angiography indicates left main stem disease or proximal three-vessel disease.

Pain Interventions

Do not offer the following interventions to manage stable angina:

- Transcutaneous electrical nerve stimulation (TENS)
- Enhanced external counterpulsation (EECP)
- Acupuncture

Stable Angina That Has Not Responded to Treatment

Offer people whose stable angina has not responded to drug treatment and/or revascularisation comprehensive re-evaluation and advice, which may include:

- Exploring the person's understanding of their condition
- Exploring the impact of symptoms on the person's quality of life
- Reviewing the diagnosis and considering non-ischaemic causes of pain
- Reviewing drug treatment and considering future drug treatment and revascularisation options
- Acknowledging the limitations of future treatment
- Explaining how the person can manage the pain themselves
- Specific attention to the role of psychological factors in pain
- Development of skills to modify cognitions and behaviours associated with pain

Cardiac Syndrome X

In people with angiographically normal coronary arteries and continuing anginal symptoms, consider a diagnosis of cardiac syndrome X.

Continue drug treatment for stable angina only if it improves the symptoms of the person with suspected cardiac syndrome X.

Do not routinely offer drugs for the secondary prevention of cardiovascular disease to people with suspected cardiac syndrome X.

Clinical Algorithm(s)

A care pathway on the management of stable angina is available in the Quick Reference Guide (see "Availability of Companion Documents" field).

Scope

Disease/Condition(s)

Stable angina

Guideline Category

Counseling

Diagnosis

Management

Prevention

Treatment

Clinical Specialty

Cardiology

Family Practice

Internal Medicine

Preventive Medicine

Intended Users

Advanced Practice Nurses

Health Care Providers

Hospitals

Nurses

Physician Assistants

Physicians

Guideline Objective(s)

To offer best practice advice on the care of people with stable angina

Target Population

Adults (18 years and older) who have been diagnosed with stable angina due to atherosclerotic disease, including:

- People of south Asian origin

- People older than 85 years
- People with chronic refractory angina
- People with diabetes
- People with normal or minimally diseased coronary arteries
- Women

Note: Groups that are not covered in the guideline include people with recent-onset chest pain or discomfort of suspected cardiac origin, people with acute coronary syndrome, people with chest pain or discomfort of unknown cause, people with angina-type pain that is likely to be due to non-cardiac disease, such as anaemia, people with angina-type pain associated with other types of heart disease, such as valvular heart disease (for example, aortic stenosis) or cardiomyopathy (for example, hypertrophic cardiomyopathy).

Interventions and Practices Considered

1. Accurate diagnosis
2. Lifestyle advice and patient education
3. Preventing and treating episodes of angina: short-acting nitrate
4. Drugs for secondary preventions
    - Aspirin
    - Angiotensin-converting enzyme (ACE) inhibitors
    - Statins
5. Anti-anginal drug treatment
    - Beta-blocker or calcium channel blocker
    - If indicated: long-acting nitrate, ivabradine, nicorandil, ranolazine
6. Revascularisation surgery for those not controlled on optimal medical management
    - Coronary artery bypass graft
    - Percutaneous coronary intervention

Major Outcomes Considered

Outcomes in Intervention Studies

- Exercise tolerance
- Nitroglycerin consumption
- Angina frequency/severity
- Myocardial infarction (MI)/non-fatal MI
- Revascularisation
- Hospitalisation
- Stroke/cerebrovascular accident
- Death
- Cardiac/cardiovascular death
- Quality of life
- Adverse events

Outcomes in Prognostic Studies

- Death
- Cardiac death/cardiovascular death
- MI/Nonfatal MI
- Revascularisation

Methodology

Methods Used to Collect/Select the Evidence

Methods Used to Collect/Select the Evidence

Hand-searches of Published Literature (Primary Sources)

Hand-searches of Published Literature (Secondary Sources)

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

Note from the National Guideline Clearinghouse (NGC): This guideline was developed by the National Clinical Guideline Centre on behalf of the National Institute for Health and Clinical Excellence (NICE). See the "Availability of Companion Documents" field for the full version of this guidance.

Clinical Literature Search

Systematic literature searches were undertaken to identify evidence within published literature in order to answer the review questions as per The NICE Guidelines Manual. Clinical databases were searched using relevant medical subject headings, free-text terms and study type filters where appropriate. Non-English studies were not reviewed and were therefore excluded from searches. All searches were conducted on core databases, Medline, EMBASE, CINAHL and The Cochrane Library. Additional subject specific databases were used for some questions. All searches were updated on the 22nd of October 2010. No papers after this date were considered.

Search strategies were checked by looking at reference lists of relevant key papers, checking search strategies in other systematic reviews and asking the Guideline Development Group (GDG) for known studies. The questions, the study types applied, the databases searched and the years covered can be found in Appendix D of the full version of the original guideline document.

During the scoping stage, a search was conducted for guidelines and reports on the websites listed below and on organisations relevant to the topic. Searching for grey literature or unpublished literature was not systematically performed. All references sent by stakeholders were considered.

- Constituent websites of the Guidelines International Network (www.g-i-n.net)
- National Guideline Clearinghouse (www.guideline.gov/)
- National Institute for Health and Clinical Excellence (NICE) (www.nice.org.uk)
- National Institutes of Health Consensus Development Program (consensus.nih.gov/)
- National Library for Health (www.library.nhs.uk/)

Health Economic Literature Search

Systematic literature searches were also undertaken to identify health economic evidence within published literature relevant to the review questions. The evidence was identified by conducting a broad search relating to the stable angina population in the National Health Service (NHS) Economic Evaluation Database (NHS EED), the Health Economic Evaluations Database (HEED) and Health Technology Assessment (HTA) databases with no date restrictions up to 13/9/10. Additionally, the search was run on Medline (years 1950–2007) and EMBASE (1996–2007), with a specific economic filter, to ensure recent publications that had not yet been indexed by these databases were identified. This was supplemented by additional searches from (1990–13/9/10) that looked for economic papers specifically relating to revascularisation, rehabilitation, nicorandil, long-acting nitrates on Medline, EMBASE, Cochrane (technology assessments [TAs] and economic evaluations [EEs]), as it became apparent that some papers in this area were not being identified through the first search.

The search strategies for health economics are included in Appendix D of the full version of the original guideline document. All searches were updated on the 13th Sept 2010. No papers after this date were considered.

Reviewing the Evidence

The Research Fellow and Health Economist:

- Identified potentially relevant studies for each review question from the relevant search results by reviewing titles and abstracts – full papers were then obtained
- Reviewed full papers against pre-specified inclusion/exclusion criteria to identify studies that addressed the review question in the appropriate population and reported on outcomes of interest (research protocols are included in Appendix C of the full version of the original guideline document)

Number of Source Documents

Not stated

Methods Used to Assess the Quality and Strength of the Evidence

Expert Consensus

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Overall Quality of Outcome Evidence in Grading of Recommendations Assessment, Development and Evaluation (GRADE)

High: Further research is *very unlikely* to change the confidence in the estimate of effect

Moderate: Further research is *likely* to have an important impact on the confidence in the estimate of effect and may change the estimate

Low: Further research is *very likely* to have an important impact on the confidence in the estimate of effect and is likely to change the estimate

Very low: Any estimate of effect is *very uncertain*

Methods Used to Analyze the Evidence

Meta-Analysis

Review of Published Meta-Analyses

Systematic Review with Evidence Tables

Description of the Methods Used to Analyze the Evidence

Note from the National Guideline Clearinghouse (NGC):This guideline was developed by the National Clinical Guideline Centre on behalf of the National Institute for Health and Clinical Excellence (NICE). See the "Availability of Companion Documents" field for the full version of this guidance.

Reviewing the Evidence

The Research Fellow and Health Economist:

- Critically appraised relevant studies using the appropriate checklist as specified in The Guidelines Manual
- Extracted key information about the study's methods and results into evidence tables (evidence tables are included in Appendix E2 in the full version of the original guideline)
- Generated summaries of the evidence by outcome (included in the relevant chapter write-ups):
    - Randomised studies: meta-analysed, where appropriate and reported in GRADE profiles (for clinical studies) – see the full version of the original guideline document for details
    - Observational studies: each study summarised in a table and narrative developed
    - Qualitative studies: each study summarised in a table and narrative developed
    - Economic studies: summarised in NICE economic evidence profiles – see the full version of the original guideline document for details.

Methods of Combining Clinical Studies

Data Synthesis for Intervention Reviews

Where possible, meta-analyses were conducted to combine the results of studies for each review question using Cochrane Review Manager (RevMan5) software. Fixed-effects (Mantel-Haenszel) techniques were used to calculate risk ratios (relative risk) for the binary outcomes: (death,

cardiac death, myocardial infarction [MI]/non-fatal MI, revascularisation, stroke, number patients free of angina, adverse events). The continuous outcome(s) (exercise tolerance, angina frequency, nitroglycerin consumption) was (were) analysed using an inverse variance method for pooling weighted mean differences and where the studies had different scales, standardised mean differences were used.

Statistical heterogeneity was assessed by considering the chi-squared test for significance at $p<0.05$ or an I-squared inconsistency statistic of >50% to indicate significant heterogeneity. When there were a high number of studies, a p-value of 0.1 was taken as a threshold for heterogeneity. The Guideline Development Group (GDG) carried out predefined subgroup analyses as defined in the protocol for each question (see Appendix B in the full version of the original guideline document).

The standard deviations of continuous outcomes were required for imputation for meta-analysis. However, in cases where this was not reported, calculation based on methods outlined in section 7.7.3 of the Cochrane Handbook: 'Data extraction for continuous outcomes' were applied to estimate the standard deviations if p values of the difference between two means, 95% confidence intervals or standard error of the mean (SEM) had been reported'. Where p values were reported as 'less than', a conservative approach was undertaken. For example, if p value was reported as '$p\leq0.001$', the calculations for standard deviations will be based on a p value of 0.001. If these statistical measures were not available then the methods described in section 16.1.3 of the Cochrane Handbook (February 2008) 'Missing standard deviations' were applied as the last resort.

For binary outcomes, absolute event rates were also calculated using the GRADEpro software using event rate in the control arm of the pooled results.

In the evidence reviews in this guideline we have presented additional data from studies along with the Grading of Recommendations Assessment, Development and Evaluation (GRADE) tables. These have been referred to as 'Additional data' and refer to data which was not analysed due to lack of sufficient reported information and/or outcomes.

Data Synthesis for Prognostic Review

Odds ratio, relative or hazard risks, with their 95% confidence intervals, from multivariate analyses were extracted from the papers. Studies were not combined in a meta-analysis for observational studies.

GRADE (Grading of Recommendations Assessment, Development and Evaluation)

The evidence for outcomes from studies which passed the quality assessment were evaluated and presented using an adaptation of the 'Grading of Recommendations Assessment, Development and Evaluation (GRADE) toolbox' developed by the international GRADE working group (http://www.gradeworkinggroup.org/). The software (GRADEpro) developed by the GRADE working group was used to assess pooled outcome data using individual study quality assessments and results from meta-analysis.

The summary of findings was presented as two separate tables in this guideline. The "Clinical Study Characteristics" table includes details of the quality assessment while the "Clinical Summary of Findings" table includes pooled outcome data, where appropriate, an absolute measure of intervention effect calculated and the summary of quality of evidence for that outcome. In this table, the columns for intervention and control indicate pooled sample size for continuous outcomes. For binary outcomes such as number of patients with an adverse event, the event rates (n/N) are shown with percentages. Reporting or publication bias was only taken into consideration in the quality assessment and included in the Clinical Study Characteristics table if it was apparent.

See the full version of the original guideline document for additional grading of quality elements.

Methods Used to Formulate the Recommendations

Expert Consensus

Description of Methods Used to Formulate the Recommendations

Note from the National Guideline Clearinghouse (NGC): This guideline was developed by the National Clinical Guideline Centre on behalf of the National Institute for Health and Clinical Excellence (NICE). See the "Availability of Companion Documents" field for the full version of this guidance.

A multidisciplinary Guideline Development Group (GDG) comprising professional group members and consumer representatives of the main stakeholders developed this guideline. The group met approximately every 6 weeks during the development of the guideline. Developers took into account both clinical and cost effectiveness when making recommendations involving a choice between alternative interventions. A review of the

economic evidence was conducted and analyses were carried out as appropriate. The unit of effectiveness was the quality-adjusted life year (QALY), and the costs considered were from an National Health Service (NHS) and personal social services (PSS) perspective. Further detail on the methods can be found in 'The guidelines manual' (see the "Availability of Companion Documents" field).

Developing the Review Questions and Outcomes

Review questions were developed based on the scope (see Appendix A in the full version of the original guideline document). They were drafted by the review team and refined and validated by the Guideline Development Group (GDG). Review questions were developed in a PICO framework (patient, intervention, comparison and outcome) for intervention reviews, risk scores and prognostic reviews. This was to guide the literature searching process and to facilitate the development of recommendations by the GDG.

Cost-Effectiveness Criteria

The NICE Guidelines Manual sets out the principles that GDGs should consider when judging whether an intervention offers good value for money. In general, an intervention was considered to be cost effective if either of the following criteria applied (given that the estimate was considered plausible):

- The intervention dominated other relevant strategies (that is, it was both less costly in terms of resource use and more clinically effective compared with all the other relevant alternative strategies), or
- The intervention cost less than £20,000 per QALY gained compared with the next best strategy

Developing Recommendations

Over the course of the guideline development process, the GDG was presented with:

- Evidence tables of the clinical and economic evidence reviewed from the literature. All evidence tables are in Appendix E2 in the full version of the guideline document
- Summary of clinical and economic evidence and quality (as presented in chapters 5–19 in the full version of the guideline document)
- Forest plots (Appendix F in the full version of the guideline document)
- A description of the methods and results of the cost-effectiveness analysis undertaken for the guideline (Appendices G and H in the full version of the guideline document).

Recommendations were drafted on the basis of this evidence whenever it was available.

When clinical and economic evidence was absent, of poor quality or conflicting, the GDG drafted recommendations based on their expert opinion. This was done through discussions in the GDG. The considerations for making these consensus based recommendations included the balance between potential harms and benefits, economic or clinical implications compared to the benefits, current practices, recommendations made in other relevant guidelines, patient preferences and equality issues. The GDG also considered whether the uncertainty was sufficient to justify delaying making a recommendation to await further research, taking into account the potential harm of failing to make a clear recommendation.

Rating Scheme for the Strength of the Recommendations

Not applicable

Cost Analysis

Economic Evidence

Eleven studies were found that included the relevant comparison of coronary artery bypass graft (CABG) or percutaneous coronary intervention (PCI) in people with stable coronary artery disease. These are summarised in the Economics Evidence Tables in Appendix G in the full version of the guideline document. However, none of the studies fully met the quality and applicability criteria. It was thus decided to build an original economic model to compare PCI and CABG, which is reported in the economic profile tables in the full version of the guideline document. The model was based on the outcomes included in the clinical review (death, myocardial infarction [MI], repeat revascularisation, angina symptoms) at different time points up to 10 years from the initial procedure. Costs considered were the initial costs associated with the procedure (PCI or CABG, including the cost of four stents in the PCI strategy), the cost of further revascularisations and further investigations, anti-anginal medications, and the cost of treating myocardial infarctions. Please see cost-effectiveness analysis in Appendix H in the full version of the guideline document for further details.

Medical treatment is more cost-effective than early revascularisation with either coronary artery bypass graft (CABG) or percutaneous coronary intervention (PCI) in people with stable coronary artery disease including people with type 2 diabetes mellitus. However if symptoms are not controlled, revascularisation is effective and could be cost-effective.

The economic evidence regarding people with stable coronary artery disease has overall minor limitations but partial applicability. The economic evidence regarding people with type 2 diabetes and stable coronary artery disease has potentially serious limitations (unclear quality-adjusted life years [QALY] calculations) and partial applicability (United States of America [USA] study).

In people with multi-vessel disease who are suitable for both CABG and PCI, PCI is more cost-effective. This result was not significant and a probabilistic analysis showed a high uncertainty around the cost-effectiveness of PCI vs. CABG. PCI was the preferred strategy in 63% of the simulations and results were dependent on the type of repeat procedure (if CABG was the procedure in more than 85% of the cases, PCI was not cost-effective). In people with single vessel disease PCI is likely to be even more cost-effective.

An original economic model showed that PCI is more cost-effective than CABG in people with multi-vessel disease eligible for both procedures. The model had a 10-year time horizon; the probabilities of clinical events at 6 months, 1 year, 2, 3, 5 and 10 years were obtained from the meta-analysis of the studies comparing PCI with stents to CABG included in the clinical review. In the model, patients in the CABG arm experienced overall fewer MI and repeat revascularisations compared to patients in the PCI arm; the incremental QALYs of CABG compared to PCI was 0.069. This small QALY gain does not justify the incremental cost of CABG compared to PCI (£2,427) as the incremental cost-effectiveness ratio is above £30,000/QALY. The higher cost of CABG is due to the higher initial cost of the procedure (£8,552 vs. £4,839 with PCI). There is however some uncertainty around this conclusion and some applicability issues (the population enrolled in the trials on which the model is based might not be representative of the wider population of patients with angina). Variation in patients' preference for one procedure or the other could play a decisive role when establishing the most cost-effective procedure. Therefore, patient preference should be assessed when discussing the revascularisation strategy.

Method of Guideline Validation

External Peer Review

Internal Peer Review

Description of Method of Guideline Validation

The guideline was validated through two consultations.

1. The first draft of the guideline (the full guideline, National Institute for Health and Clinical Excellence [NICE] guideline, and Quick Reference Guide) were consulted with Stakeholders and comments were considered by the Guideline Development Group (GDG)
2. The final consultation draft of the full guideline, the NICE guideline and the Information for the Public were submitted to stakeholders for final comments.

The final draft was submitted to the Guideline Review Panel for review prior to publication.

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The type of evidence supporting the recommendations is not specifically stated.

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

- Appropriate care of people with stable angina

- Prevention of secondary cardiac disease

Potential Harms

- Adverse effects of short-acting nitrates include flushing, headache, and light-headedness.
- Side effects of other medications
- Complications of surgery

Qualifying Statements

Qualifying Statements

- This guidance represents the view of National Institute of Health and Clinical Excellence (NICE), which was arrived at after careful consideration of the evidence available. Healthcare professionals are expected to take it fully into account when exercising their clinical judgement. However, the guidance does not override the individual responsibility of healthcare professionals to make decisions appropriate to the circumstances of the individual patient, in consultation with the patient and/or guardian or carer, and informed by the summary of product characteristics of any drugs they are considering.
- Implementation of this guidance is the responsibility of local commissioners and/or providers. Commissioners and providers are reminded that it is their responsibility to implement the guidance, in their local context, in light of their duties to avoid unlawful discrimination and to have regard to promoting equality of opportunity. Nothing in this guidance should be interpreted in a way that would be inconsistent with compliance with those duties.

Implementation of the Guideline

Description of Implementation Strategy

Key Priorities for Implementation

The following recommendations have been identified as priorities for implementation.

- Explore and address issues according to the person's needs, which may include:
  - Self-management skills such as pacing their activities and goal setting
  - Concerns about the impact of stress, anxiety or depression on angina
  - Advice about physical exertion including sexual activity
- Offer people optimal drug treatment for the initial management of stable angina. Optimal drug treatment consists of one or two anti-anginal drugs as necessary plus drugs for secondary prevention of cardiovascular disease.
- Consider revascularisation (coronary artery bypass graft [CABG] or percutaneous coronary intervention [PCI]) for people with stable angina whose symptoms are not satisfactorily controlled with optimal medical treatment.
- When either procedure would be appropriate, explain to the person the risks and benefits of PCI and CABG for people with anatomically less complex disease whose symptoms are not satisfactorily controlled with optimal medical treatment. If the person does not express a preference, take account of the evidence that suggests that PCI may be the more cost-effective procedure in selecting the course of treatment.
- When either procedure would be appropriate, take into account the potential survival advantage of CABG over PCI for people with multivessel disease whose symptoms are not satisfactorily controlled with optimal medical treatment and who:
  - Have diabetes or
  - Are over 65 years or
  - Have anatomically complex three-vessel disease, with or without involvement of the left main stem
- Consider the relative risks and benefits of CABG and PCI for people with stable angina using a systematic approach to assess the severity and complexity of the person's coronary disease, in addition to other relevant clinical factors and comorbidities.
- Ensure that there is a regular multidisciplinary team meeting to discuss the risks and benefits of continuing drug treatment or the revascularisation strategy (CABG or PCI) for people with stable angina. The team should include cardiac surgeons and interventional

cardiologists. Treatment strategy should be discussed for the following people, including but not limited to:
    - People with left main stem or anatomically complex three-vessel disease
    - People in whom there is doubt about the best method of revascularisation because of the complexity of coronary anatomy, the extent of stenting required or other relevant clinical factors and comorbidities
- Ensure people with stable angina receive balanced information and have the opportunity to discuss the benefits, limitations and risks of continuing drug treatment, CABG and PCI to help them make an informed decision about their treatment. When either revascularisation procedure is appropriate, explain to the person:
    - The main purpose of revascularisation is to improve the symptoms of stable angina.
    - CABG and PCI are effective in relieving symptoms.
    - Repeat revascularisation may be necessary after either CABG or PCI and the rate is lower after CABG.
    - Stroke is uncommon after either CABG or PCI, and the incidence is similar between the two procedures.
    - There is a potential survival advantage with CABG for some people with multivessel disease.
- Discuss the following with people whose symptoms are satisfactorily controlled with optimal medical treatment:
    - Their prognosis without further investigation
    - The likelihood of having left main stem disease or proximal three-vessel disease
    - The availability of CABG to improve the prognosis in a subgroup of people with left main stem or proximal three-vessel disease
    - The process and risks of investigation
    - The benefits and risks of CABG, including the potential survival gain.

Implementation Tools

Audit Criteria/Indicators

Clinical Algorithm

Foreign Language Translations

Patient Resources

Quick Reference Guides/Physician Guides

Resources

Slide Presentation

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Getting Better

Living with Illness

Staying Healthy

IOM Domain

Effectiveness

Patient-centeredness

Identifying Information and Availability

Bibliographic Source(s)

National Clinical Guideline Centre. Management of stable angina. London (UK): National Institute for Health and Clinical Excellence (NICE); 2011 Jul. 34 p. (Clinical guideline; no. 126).

Adaptation

Not applicable: The guideline was not adapted from another source.

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Guideline Committee

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Financial Disclosures/Conflicts of Interest

At the start of the guideline development process all GDG members all members of the NCGC staff declared interests including consultancies, fee-paid work, share-holdings, fellowships and support from the healthcare industry. At all subsequent GDG meetings, members declared arising conflicts of interest, which were also recorded. Members were either required to withdraw completely or for part of the discussion if their declared interest made it appropriate.

No interests were declared that required actions. The details of declared interests are shown in Appendix J of the full version of the original

guideline document.

Guideline Status

This is the current release of the guideline.

Guideline Availability

Electronic copies: Available from the National Institute for Health and Clinical Excellence (NICE) Web site .

Availability of Companion Documents

The following are available:

- Stable angina. Quick reference guide. London (UK): National Institute for Health and Clinical Excellence (NICE); 2011 Jul. 13 p. (Clinical guideline; no. 126). Electronic copies: Available in Portable Document Format (PDF) from the National Institute for Health and Clinical Excellence (NICE) Web site .
- Stable angina. Full guideline. London (UK): National Institute for Health and Clinical Excellence (NICE); 2011 Jul. 468 p. (Clinical guideline; no. 126). Electronic copies: Available in PDF from the NICE Web site .
- Stable angina. Appendices. London (UK): National Institute for Health and Clinical Excellence (NICE); 2011 Jul. Various p. (Clinical guideline; no. 126). Electronic copies: Available in PDF from the NICE Web site .
- Stable angina. Clinical audit tool. London (UK): National Institute for Health and Clinical Excellence (NICE); 2011 Jul. Various p. (Clinical guideline; no. 126). Electronic copies: Available from the NICE Web site .
- Stable angina. Costing statement. London (UK): National Institute for Health and Clinical Excellence (NICE); 2011 Jul. 6 p. (Clinical guideline; no. 126). Electronic copies: Available in PDF from the NICE Web site .
- Stable angina. Slide set. Implementing NICE guidance. London (UK): National Institute for Health and Clinical Excellence (NICE); 2011 Jul. 22 p. (Clinical guideline; no. 126). Electronic copies: Available from the NICE Web site .
- Stable angina. Baseline assessment tool. Implementing NICE guidance. London (UK): National Institute for Health and Clinical Excellence (NICE); 2011. (Clinical guideline; no. 126). Electronic copies: Available from the NICE Web site .
- Factsheet on revascularisation for stable angina. London (UK): National Institute for Health and Clinical Excellence (NICE); 2011 Jul. 31 p. (Clinical guideline; no. 126). Electronic copies: Available in PDF from the NICE Web site .
- The guidelines manual 2009. London (UK): National Institute for Health and Clinical Excellence (NICE); 2009 Jan. Electronic copies: Available in Portable Document Format (PDF) from the NICE Archive Web site .

Patient Resources

The following is available:

- Stable angina. Understanding NICE guidance. Information for people who use NHS services. London (UK): National Institute for Health and Clinical Excellence; 2011 Jul. 12 p. (Clinical guideline; no. 126). Electronic copies: Available in Portable Document Format (PDF) from the National Institute for Health and Clinical Excellence (NICE) Web site . Also available in Welsh from the NICE Web site .

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NGC Status

This NGC summary was completed by ECRI Institute on February 24, 2012. This summary was updated by ECRI Institute on April 13, 2012 following the U.S. Food and Drug Administration advisories on Statin Drugs and Statins and HIV or Hepatitis C drugs.

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